REMARKS

As a preliminary matter, the Examiner has rejected Claim 2 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner objects tot eh use of the word "type" in Claim 2. Accordingly, Applicants have currently amended Claim 2 to delete the word "type". Applicants therefore respectfully assert that Claim 2 is now in appropriate form.

The Examiner has rejected claims 1, 4, and 5 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,063,970 to Johansen et al. ("Johansen"). The Examiner has also rejected Claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Johansen in view of U.S. Patent No. 5,851,280 to Belmont et al. ("Belmont"). In addition, the Examiner has rejected Claim 6 under 35 U.S.C. § 103(a) as being unpatentable over Johansen in view of JP 08300866. The Examiner has also rejected claims 1, 4, and 6 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,667,569 to Fujioka ("Fujioka"). In addition, the Examiner has rejected claims 7-12 under 35 U.S.C. § 102(b) as being unpatentable over U.S. Patent No. 6,440,203 to Kato ("Kato").

The Examiner has indicated that the after final amendment filed on July 23, 2007 has not been entered as a result of the Examiner issuing the current non-final Office Action. Accordingly, the most recent version of the claims prior to the filing of this Response/Amendment is contained in the Response/Amendment filed with the USPTO on August 3, 2006. Thus, the claim amendments contained in the current Response/Amendment are based on the set of claims as amended in the August 3, 2006 Response/Amendment.

Claim 2 is currently amended. Claims 3 and 9 stand previously canceled. As a result, claims 1, 2, 4-8, and 10-12 are currently pending. The following remarks are considered by applicant to overcome each of the Examiner's outstanding rejections to current claims 1, 2, 4-8, and 10-12. An early Notice of Allowance is therefore requested.

I. SUMMARY OF RELEVANT LAW

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The determination of obviousness rests on whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. In determining obviousness, four factors should be weighed: (1) the scope and content of the prior art, (2) the differences between the art and the claims at issue, (3) the level of ordinary skill in the art, and (4) whatever objective evidence may be present. Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor. The Examiner carries the burden under 35 U.S.C. § 103 to establish a prima facie case of obviousness and must show that the references relied on teach or suggest all of the limitations of the claims.

II. REJECTION OF CLAIMS 1, 4, AND 5 UNDER 35 U.S.C. § 102(E) BASED ON JOHANSEN

On page 3 of the current Office Action, the Examiner rejects claims 1, 4, and 5 under 35 U.S.C. § 102(e) as being anticipated by Johansen. This rejection is respectfully traversed and believed overcome in view of the following discussion.

A. JOHANSEN FAILS TO DISCLOSE "AN INK" AS CLAIMED IN CLAIM 1

Claim 1 states, in part:

> "**An ink** for ink-jet recording comprising tripropylene glycol normal butyl ether, an acrylic polymer, a water-insoluble coloring agent, and water;" (emphasis added).

The Examiner asserts that the preamble "an ink for ink-jet recording" does not state any distinct definition of any of the claimed invention's limitations and that the purpose or intended use (i.e., ink for ink-jet recording) does not result in a structural difference between the presently claimed invention and the prior art composition. Office Action (8/7/07), P. 4. This argument, however, focuses on the language "for ink-jet recording" and appears to completely ignore that Claim 1 claims "an ink", and not a paint as disclosed in Johansen.

The American Heritage Dictionary defined "ink", in relevant part, as "1. A pigmented liquid or paste used especially for writing or printing." "ink." *The American Heritage® Dictionary of the English Language, Fourth Edition.* Houghton Mifflin Company, 2004. 19 Sep. 2007. <Dictionary.com http://dictionary.reference.com/browse/ink>. A copy of the Dictionary.com webpage containing the referenced definition for "ink" has been attached as Appendix A.

In contrast, the American Heritage Dictionary defined "paint", in relevant part, as:

> "1.
>
> "a. A liquid mixture, usually of a solid pigment in a liquid vehicle, used as a decorative or protective coating.
>
> "b. The thin dry film formed by such a mixture when applied to a surface.
>
> "c. The solid pigment before it is mixed with a vehicle."

"paint." *The American Heritage® Dictionary of the English Language, Fourth Edition.* Houghton Mifflin Company, 2004. 19 Sep. 2007. <Dictionary.com http://dictionary.reference.com/browse/ink>. A copy of the Dictionary.com webpage containing the referenced definition for "paint" has been attached as Appendix B.

Claim 1 specifically claims, in part, "[a]n ink". This portion of the preamble is structural, rather than related to the purpose or intended use of the invention. Accordingly, Johansen would have to disclose, among other things, "an ink" in order for Johansen to satisfy the burden of anticipation by disclosing each and every element as set forth in Claim 1. Johansen, however, completely fails to disclose any ink whatsoever. Accordingly, Applicants respectfully assert that Johansen fails to disclose each and every element as set forth in Claim 1.

As such, Applicant respectfully asserts that Examiner has failed to establish a prima facie case of anticipation of independent Claim 1. Therefore, Applicants respectfully request that Examiner remove the rejection of Claim 1 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,063,970 to Johansen et al.

B. JOHANSEN FAILS TO DISCLOSE CLAIM 1 WITH "SUFFICIENT SPECIFICITY"

Claim 1 also states, in part:

> "wherein a blending ratio of the tripropylene glycol normal butyl ether with respect to the acrylic polymer **is 0.5 to 2 on the basis of weight.**" (emphasis added).

The acrylic polymer has a first property in which it is adsorbed to the coloring agent, and also a second property in which it is localized in the vicinity of the gas-liquid interfaces and solid-liquid interfaces in the ink. If there is not any compound affecting the acrylic polymer in the ink, the first and the second properties of the acrylic polymer are well balanced (equilibrium) depending on the strength of one of the properties.

That is, in ordinary cases, an excessive amount of the acrylic polymer, which is not adsorbed to the coloring agent, has been localized by the surface activity in the vicinity of the surfaces of the ink droplets (gas-liquid interfaces and solid-liquid interfaces) in the ink for ink-jet recording containing the acrylic polymer. Application (as published), ¶ [0015]. Therefore, when the ink droplets are adhered to portions disposed around the nozzle of the recording head, and the water is evaporated, then the concentration of the acrylic polymer is extremely increased in the vicinity of the surfaces of the ink droplets to form sticky or cohesive residues having high viscosities which behave as the obstacle to inhibit the straight travel stability of the ink droplets during the discharge of the ink from the nozzle. *Id.*

When the tripropylene glycol normal butyl ether and/or the dipropylene glycol normal propyl ether is contained in the ink for ink-jet recording containing the acrylic polymer, the tripropylene glycol normal butyl ether and/or the dipropylene glycol normal propyl ether exists in the vicinity of the surfaces of the ink droplets in place of the acrylic polymer, because the ethers have a stronger surface-activating function as compared with the acrylic polymer. *Id.* As a result, the localization of the acrylic polymer is avoided on the ink droplet surfaces, and most of acrylic polymer tends to be adsorbed to the coloring agent. *Id.* In order to cause such adsorption of the acrylic polymer to the coloring agent, a particular amount of the tripropylene glycol normal butyl ether and/or dipropylene glycol normal propyl ether with respect to the acrylic polymer is needed.

At one end, it has been found that a minimum of 0.5 of the tripropylene glycol normal butyl ether and/or dipropylene glycol normal propyl ether with respect to the acrylic polymer is needed. See Application (as published), ¶ [0016] and Examples. At the other end, if the blending ratio exceeds a maximum of 2, the phenomenon of tripropylene glycol normal butyl ether and/or dipropylene glycol normal propyl ether localization in the vicinity of the gas-liquid interfaces has been saturated and the tripropylene glycol normal butyl ether or dipropylene glycol normal propyl ether also affects the adsorption of acrylic polymer to the coloring agent.

Accordingly, the acrylic polymer, that was once adsorbed to the coloring agent and is now free, might replace some of the tripropylene glycol normal butyl ether or dipropylene glycol normal propyl ether that exists in the vicinity of the surfaces of the ink droplets. Therefore, it is desired that the blending ratio is not more than 2. See Application (as published) ¶ [0016] and Examples. Thus, the blending ratio 0.5 to 2 of tripropylene glycol normal butyl ether or dipropylene glycol normal propyl ether with respect to the acrylic polymer is important for the effect of the tripropylene glycol normal butyl ether or dipropylene glycol normal propyl ether.

With respect to this claim, Examiner contends that, since Johansen discloses the solvent (e.g., tripropylene glycol n-butyl ether) can be 2-10% and the binder (e.g., acrylic compound) can be 5-40%, Johansen discloses that the ratio of solvent to binder can be 0.05 to2. Office Action (8/7/07), P. 3-4 (citing Johansen, Col. 7, Lns. 23-33, Col. 8, Lns. 8-10 and 15-23). As a preliminary matter, it should be noted that Johansen states the binder may constitute 5-50% by weight of the total paint composition, and that the solvent may constitute 0-50% by weight of the paint composition. Johansen, Col. 7, Lns. 23-33, Col. 8, Lns. 8-10 and 15-23. Therefore, using the Examiner's math, the range disclosed in Johansen of the solvent to the binder in a paint is 0 (0%/50%) to 10 (50%/5%).

Examiner, in effect, argues that while not all paints with the disclosed amounts of solvent and binder in Johansen fall within the claimed ratio range of 0.5-2 of the current application, some combinations do fall within that range. However, Johansen never discloses any specific examples falling within the claimed range. In addition, the range disclosed in Johansen is 0 to 10, as described above.

The MPEP provides instruction for situations like this:

> When the prior art discloses a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. ... If the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of **unexpected results** within the claimed narrow range ... it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims. The unexpected results may also render the claims unobvious. The question of "sufficient specificity" is similar to that of "clearly envisaging" a species from a generic teaching. See MPEP § 2131.02. A 35 U.S.C. 102/103 combination rejection is permitted if it is unclear if the reference teaches the range with "sufficient specificity." **The examiner must, in this case, provide reasons for anticipation as well as a motivational statement regarding obviousness.**

MPEP § 2131.03[II] (emphasis added).

1. Unexpected Results

The unexpected result in this case is that, when an acrylic polymer is used in an ink, the requirements for straight travel stability of ink droplets during the discharge, recovery performance upon introduction into the recording head, fixation performance of printed matters, and drying performance after printing can be met by adjusting the blending ratio of tripropylene glycol normal butyl ether with respect to the acrylic polymer to be in the range of 0.5 to 2 on the basis of weight.

The inventors of the present application discovered, among numerous combinations, that the combination of tripropylene glycol normal butyl ether and the acrylic polymer, in the specified proportional range of Claim 1, is excellent in straight travel stability, recovery performance, fixation performance, and drying performance as indicated in Table 12 of the present application.

Before Applicants' discoveries, adding an acrylic polymer to improve the recovery performance upon introduction into the recording head and improve the fixation performance, resulted in unstable discharge from the recording head and deteriorated straight travel stability of ink droplets. Application (as published), P. 1, ¶¶ [0007]-[0008]. It was unexpected that adding tripropylene glycol normal butyl ether, such that the blending ratio of tripropylene glycol normal butyl ether with respect to the acrylic polymer is 0.5 to 2 on the basis of weight, would stabilize discharge from the recording head and improve straight travel stability while maintaining the improved fixation performance. Because of this unexpected result, Applicants respectfully assert that the narrow claimed ratio range of 0.5 to 2 is not disclosed by Koga with "sufficient specificity" to constitute an anticipation of the claims.

2. No Reason for Anticipation or Motivation for Obviousness

Johansen provides neither reason for anticipation nor any motivation regarding obviousness. First, Johansen never discloses any effect on straight travel stability or recording head discharge stability by adding tripropylene glycol normal butyl ether to an ink containing an acrylic polymer. In fact, Johansen never discloses any type of ink whatsoever. As such there is no reason for anticipation of the unexpected results of the current application that modifying the proportion of tripropylene glycol normal butyl ether to the acrylic polymer, such that their

blending ratio is 0.5 to 2 on the basis of weight, improves the straight travel stability while maintaining the improved recovery performance and fixation performance obtained by the addition of the acrylic polymer.

Second, Johansen teaches solving the problem of preservation of water based paints. Johansen, Col. 1, Lns. 15-19. Never does Johansen discuss any interaction between tripropylene glycol normal butyl ether and an acrylic polymer. In fact, the acrylic compounds in Johansen are disclosed as binders rather than for use to improve recovery performance and fixation performance. Johansen, Col. 7, Lns. 26-33.

Since Johansen never discusses inks and never discusses any of the problems addressed by the current application and uses the acrylic compounds only as binders, it provides no motivation to solve the problems addressed in the current application. As such, Johansen does not render the narrowly claimed ratio range of 0.5 to 2 obvious.

Claim 1 also states, in part:

> "wherein a content of the acrylic polymer is **0.1 to 5 %** by weight with respect to a total amount of the ink." (emphasis added).

Johansen teaches in Col. 7, Lns. 26-33 that binders (acrylic compounds) may preferably constitute 5-50% w/w of the total paint composition, preferably 5-40% w/w such as 10-30% w/w. These preferable ranges of binders taught in Johansen are much different from the claimed content of the acrylic polymer as recited in amended Claim 1, namely "0.1 to 5 % by weight with respect to a total amount of the ink."

As stated above, the definition of a "paint" states that a "paint" is used as a decorative or protective coating. Therefore, the paint requires a large amount of the binder so that the paint is firmly fixed to a variety of objects to be painted. In particular, when the paint is used as a protective coating, the paint is also used outdoors, which in turn required the paint to have sufficient fixing property enough to endure the use in outdoor environment.

On the other hand, since an "ink" is used especially for writing or printing, the ink does not need to contain the acrylic compound (binder) as much as the "paint" does. In particular, if the binder is used in an ink for ink-jet recording in the content range taught in Johansen (i.e., 5-50% w/w of the total paint composition, preferably 5-40% w/w such as 10-30% w/w), then the viscosity of the ink is too increased, resulting in deteriorating the straight travel stability of the ink droplets during the discharge of the ink from the nozzle. Therefore, Applicants respectfully assert that Johansen fails to disclose the above language of Claim 1.

As such, Applicants respectfully assert that Claim 1 is not disclosed with "sufficient specificity" by Johansen to constitute anticipation. Therefore, Applicants respectfully request that Examiner remove the rejection of Claim 1 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,063,970 to Johansen et al.

C. CLAIM 4

Claim 4 is dependant upon Claim 1. As Claim 1 is allowable, so must be Claim 4. In addition, Claim 4 states, in part:

> "wherein a content of the tripropylene glycol normal butyl ether is 0.5 to 5% by weight with respect to a total amount of the ink."

With respect to this claim, Examiner contends that, since Johansen discloses the solvent can be in the range of 0-50% it anticipates the claimed range. Office Action (8/7/07), P. 3, ¶ 5. However, Johansen never discloses any specific examples falling within the claimed range. In addition, the range disclosed in Koga both overlaps and is larger than the narrowly claimed range in the current application.

As with Claim 1 above, the MPEP provides instruction for situations like this. MPEP § 2131.03[II].

1. Unexpected Results

The unexpected result in this case is that, when an acrylic polymer is used in an ink, the requirements for straight travel stability of ink droplets during the discharge, recovery performance upon introduction into the recording head, fixation performance of printed matters, and drying performance after printing can be met by the addition of tripropylene glycol normal butyl ether in the range of 0.5 to 5% by weight with respect to a total amount of the ink.

The inventors of the present application discovered, among numerous combinations, that the combination of the acrylic polymer and tripropylene glycol normal butyl ether, in the specified range of Claim 4, is excellent in straight travel stability, recovery performance, fixation performance, and drying performance as indicated in Table 12 of the present application.

Before Applicants' discoveries, adding an acrylic polymer to improve the recovery performance upon introduction into the recording head and improve the fixation performance, resulted in unstable discharge from the recording head and deteriorated straight travel stability of ink droplets. Application (as published), P. 1, ¶¶ [0007]-[0008]. It was

unexpected that adding tripropylene glycol normal butyl ether, such that the content of tripropylene glycol normal butyl ether is 0.5 to 5% by weight with respect to the total amount of the ink, would stabilize discharge from the recording head and improve straight travel stability while maintaining the improved fixation performance. Because of this unexpected result, Applicants respectfully assert that the narrow claimed ratio range of 0.5 to 5% is not disclosed by Koga with "sufficient specificity" to constitute an anticipation of the claims.

2. No Reason for Anticipation or Motivation for Obviousness

Johansen provides neither reason for anticipation nor any motivation regarding obviousness. First, Johansen never discloses any effect on straight travel stability or recording head discharge stability by adding tripropylene glycol normal butyl ether to an ink containing an acrylic polymer. In fact, Johansen never discloses any type of ink whatsoever. As such there is no reason for anticipation of the unexpected results of the current application that the addition of tripropylene glycol normal butyl ether to an ink containing an acrylic polymer, such that the content of tripropylene glycol normal butyl ether is 0.5 to 5% by weight with respect to a total amount of the ink, improves the straight travel stability while maintaining the improved recovery performance and fixation performance obtained by the addition of the acrylic polymer.

Second, Johansen teaches solving the problem of preservation of water based paints. Johansen, Col. 1, Lns. 15-19. Never does Johansen discuss any interaction between tripropylene glycol normal butyl ether and an acrylic polymer. In fact, the acrylic compounds in Johansen are disclosed as binders rather than for use to improve recovery performance and fixation performance. Johansen, Col. 7, Lns. 26-33.

Since Johansen never discusses inks and never discusses any of the problems addressed by the current application and uses the acrylic compounds only as binders, it provides no motivation to solve the problems addressed in the current application. As such, Johansen does not render the narrowly claimed ratio range of 0.5 to 2 obvious.

As such, Applicants respectfully assert that Claim 4 is not disclosed with "sufficient specificity" by Johansen to constitute anticipation. Therefore, Applicants respectfully request that Examiner remove the rejection of Claim 4 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,063,970 to Johansen et al.

D. CLAIM 5

Claim 5 is dependant upon Claim 1. As Claim 1 is allowable, so must be Claim 5. Therefore, Applicants respectfully request that Examiner remove the rejection of Claim 5 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,063,970 to Johansen et al.

III. REJECTION OF CLAIM 2 UNDER 35 U.S.C. § 103(A) BASED ON JOHANSEN IN VIEW OF BELMONT

On pages 5-6 of the current Office Action, the Examiner rejects Claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Johansen in view of Belmont. This rejection is respectfully traversed and believed overcome in view of the following discussion.

Claim 2 is dependent from Claim 1. Since Claim 1 is allowable as discussed above, so must be Claim 2. As such, Applicant respectfully asserts that Examiner has failed to establish a prima facie case of obviousness of Claim 2. Therefore, Applicants respectfully request that Examiner remove the rejection of Claim 2 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 7,063,970 to Johansen et al. in view of U.S. Patent No. 5,851,280 to Belmont et al.

IV. REJECTION OF CLAIM 6 UNDER 35 U.S.C. § 103(A) BASED ON JOHANSEN IN VIEW OF JP 08300886

On page 6 of the current Office Action, the Examiner rejects Claim 6 under 35 U.S.C. § 103(a) as being unpatentable over Johansen in view of JP 08300886. This rejection is respectfully traversed and believed overcome in view of the following discussion.

Claim 6 is dependent from Claim 1. Since Claim 1 is allowable as discussed above, so must be Claim 6. As such, Applicant respectfully asserts that Examiner has failed to establish a prima facie case of obviousness of Claim 6. Therefore, Applicants respectfully request that Examiner remove the rejection of Claim 6 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 7,063,970 to Johansen et al. in view of JP 08300886.

V. REJECTION OF CLAIMS 1, 4, AND 6 UNDER 35 U.S.C. § 103(A) BASED ON FUJIOKA

On pages 7 and 9 of the current Office Action, the Examiner rejects claims 1, 4, and 6 under 35 U.S.C. § 103(a) as being unpatentable over Fujioka. This rejection is respectfully traversed and believed overcome in view of the following discussion.

As stated above, Claim 1 states, in part:

> "wherein a blending ratio of the tripropylene glycol normal butyl ether with respect to the acrylic polymer **is 0.5 to 2 on the basis of weight.**" (emphasis added).

Examiner admits that Fujioka fails to disclose the above claim language. Office Action (8/7/07), P. 7. Rather, the Examiner asserts that Fujioka discloses a ratio of tripropylene glycol monobutyl ether to styrene-anhydrous maleic acid copolymer of 0.71 in Example 5. Examiner then asserts that Fujioka discloses that acrylic resin is equivalent an interchangeable with styrene-anhydrous maleic acid copolymer. This, however, misunderstands the teachings of Fujioka.

Fujioka does not disclose that acrylic resin is equivalent an interchangeable with styrene-anhydrous maleic acid copolymer. Rather, Fujioka discloses that both acrylic resin and styrene-anhydrous maleic acid copolymer are examples of dispersants that may be used. Fujioka, Col. 3, Lns. 6-18. The two compounds are not equivalent and interchangeable in exact propositions simply because they are both examples of dispersants. Accordingly, one of ordinary skill in the art would not find it obvious to use an acrylic resin **in the exact same amount** as styrene-anhydrous maleic acid copolymer. Therefore, Fujioka does not make it obvious to have a ratio of tripropylene glycol normal butyl ether with respect to the acrylic polymer of 0.71.

Rather, Fujioka discloses that acrylic polymers may be present in an amount of 1-20% by weight. Fujioka, Col. 3, Lns. 6-32. Fujioka also discloses that polyvalent alcohols (e.g., tripropylene glycol monobutyl ether) may be present in an amount of 5-50% by weight. Fujioka, Col. 3, Lns. 58-59, Col. 4, Ln. 22. Accordingly, Fujioka, at best, might disclose a ratio of tripropylene glycol normal butyl ether with respect to an acrylic polymer of 0.25 (5%/20%) to 50 (50%/1%).

As in the discussion of Claim 1 and Johansen above, the MPEP provides instruction for situations like this. MPEP § 2131.03[II].

1. Unexpected Results

The unexpected result in this case is that, when an acrylic polymer is used in an ink, the requirements for straight travel stability of ink droplets during the discharge, recovery performance upon introduction into the recording head, fixation performance of printed matters, and drying performance after printing can be met by adjusting the blending ratio of tripropylene glycol normal butyl ether with respect to the acrylic polymer to be in the range of 0.5 to 2 on the basis of weight.

The inventors of the present application discovered, among numerous combinations, that the combination of tripropylene glycol normal butyl ether and the acrylic polymer, in the specified proportional range of Claim 1, is excellent in straight travel stability, recovery performance, fixation performance, and drying performance as indicated in Table 12 of the present application.

Before Applicants' discoveries, adding an acrylic polymer to improve the recovery performance upon introduction into the recording head and improve the fixation performance, resulted in unstable discharge from the recording head and deteriorated straight travel stability of ink droplets. Application (as published), P. 1, ¶¶ [0007]-[0008]. It was unexpected that adding tripropylene glycol normal butyl ether, such that the blending ratio of tripropylene glycol normal butyl ether with respect to the acrylic polymer is 0.5 to 2 on the basis of weight, would stabilize discharge from the recording head and improve straight travel stability while maintaining the improved fixation performance. Because of this unexpected result, Applicants respectfully assert that the narrow claimed ratio range of 0.5 to 2 is not disclosed by Koga with "sufficient specificity" to constitute an anticipation of the claims.

2. No Reason for Anticipation or Motivation for Obviousness

Fujioka provides neither reason for anticipation nor any motivation regarding obviousness. First, Fujioka never discloses any effect on straight travel stability or recording head discharge stability by adding tripropylene glycol normal butyl ether to an ink containing an acrylic polymer. As such there is no reason for anticipation of the unexpected results of the current application that modifying the proportion of tripropylene glycol normal butyl ether to the acrylic polymer, such that their blending ratio is 0.5 to 2 on the basis of weight, improves the

straight travel stability while maintaining the improved recovery performance and fixation performance obtained by the addition of the acrylic polymer.

Second, Fujioka never discuss any interaction between tripropylene glycol normal butyl ether and an acrylic polymer. In fact, the acrylic compounds in Fujioka are disclosed as dispersants for pigments rather than for use to improve recovery performance and fixation performance. Johansen, Col. 3, Lns. 1-33.

Since Fujioka never discusses any of the problems addressed by the current application and uses the acrylic compounds only as dispersants, it provides no motivation to solve the problems addressed in the current application. As such, Fujioka does not render the narrowly claimed ratio range of 0.5 to 2 obvious.

In addition, the Examiner asserts that the data contained in comparative examples 1-5 of the current application is not persuasive given that there is no comparison between the ink of the present invention and the ink of Fujioka. This, however, is a misreading of Fujioka. More specifically, there is comparison between the ink of the present invention and the ink of Fujioka.

Two of the polyvalent alcohols disclosed along with tripropylene glycol monobutyl ether in Fujioka are (1) diethylene glycol monomethyl ether and (2) tripropylene glycol monomethyl ether. Fujioka, Col. 4, Lns. 8-23. As stated in Applicants' response filed January 13, 2006, the comparative examples of the present application can be summarized as follows:

Comparative Example 1	Tripropylene glycol normal butyl ether was singly used.
Comparative Example 2	Polyacrylic acid sodium salt was singly used.
Comparative Example 3	**Tripropylene glycol methyl ether and Polyacrylic acid sodium salt were used.**
Comparative Example 4	**Diethylene glycol diethyl ether and Polyacrylic acid sodium salt were used.**
Comparative Example 5	Triethylene glycol dimethyl ether and Polyacrylic acid sodium salt were used.
Comparative Example 6	Triethylene glycol dimethyl ether and salt of copolymer of acrylic acid/sulfonic acid monomer were used.

As can be seen in Comparative Examples 3 and 4, the comparative examples of the present application do compare the current invention to inks including tripropylene glycol methyl ether and diethylene glycol diethyl ether respectively. These inks were found to be

inadequate. Accordingly, the current application does compare the ink of Fujioka to the present invention, and found the ink of Fujioka to be lacking. This not only further illustrates the unexpected results, but it also shows that no one of ordinary skill in the art would find it obvious to combine tripropylene glycol normal butyl ether with the acrylic polymer, such that their blending ratio is 0.5 to 2 on the basis of weight, as claimed in Claim 1.

Moreover, Fujioka never realizes any "criticality" of using tripropylene glycol normal butyl ether, let alone any "criticality" of combining tripropylene glycol normal butyl ether with the acrylic polymer, such that their blending ratio is 0.5 to 2 on the basis of weight, as claimed in Claim 1. All Example 5 of Fujioka discloses is that tripropylene glycol normal butyl ether may be used in an ink. Example 5 doesn't even disclose tripropylene glycol normal butyl ether combined with the acrylic polymer, let alone combined in the claimed blending ratio.

Claim 1 also states, in part:

> "wherein a content of the acrylic polymer is **0.1 to 5 %** by weight with respect to a total amount of the ink." (emphasis added).

As stated above, Fujioka discloses that acrylic polymers may be present in an amount of 1-20% by weight. This range of acrylic polymer in Fujioka is much broader than the claimed content of the acrylic polymer as recited in amended Claim 1, namely "0.1 to 5 % by weight with respect to a total amount of the ink".

Thus, Applicants respectfully assert that a prima facie case does not exist based on Fujioka since Fujioka does not specifically teach or suggest the feature of "a content of the acrylic polymer is 0.1 to 5 % by weight with respect to a total amount of the ink", as recited in Claim 1.

Because Applicants have established a case of unexpected results of the claimed ratio of tripropylene glycol normal butyl ether to acrylic polymer, and because Examiner has failed to establish a *prima facie* case of obviousness due to the inadequacies of Fujioka's disclosure, Applicants respectfully request that Examiner remove the rejection of Claim 1 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,667,569 to Fujioka.

VI. REJECTION OF CLAIMS 7- 8 AND 10-12 UNDER 35 U.S.C. § 103(A) BASED ON KATO

In pages 8 and 10 of the current Office Action, the Examiner rejects claims 7, 8, and 10-12 under 35 U.S.C. § 103(a) as being anticipated by Kato. This rejection is respectfully traversed and believed overcome in view of the following discussion.

With respect to this rejection, Examiner contends Kato discloses an ink-jet ink comprising water, 0.1-10% self-dispersing carbon black, acrylic resin which is a dispersant for a second colorant present in the ink, and 1-20% solvent such as dipropylene glycol mono-n-propyl ether. Office Action (8/7/07), P. 8 (citing Kato, Col. 1, Lns. 9-10; Col. 2, Lns. 33-35 and 40-41; Col. 3, Lns. 55-58; Col. 4, Lns. 43-48; Col. 5, Ln. 3; Col. 7, Lns 42-46; Col. 8, Lns. 2-3 and 6-8; Col. 14, Lns. 3-9).

A. CLAIM 7

Amended Claim 7 states, in part

> "wherein a blending ratio of the dipropylene glycol normal propyl ether with respect to the acrylic polymer is 0.5 to 2 on the basis of weight."

The acrylic polymer has a first property in which it is adsorbed to the coloring agent, and also a second property in which it is localized in the vicinity of the gas-liquid interfaces and solid-liquid interfaces in the ink. If there is not any compound affecting the acrylic polymer in the ink, the first and the second properties of the acrylic polymer are well balanced (equilibrium) depending on the strength of one of the properties.

That is, in ordinary cases, an excessive amount of the acrylic polymer, which is not adsorbed to the coloring agent, has been localized by the surface activity in the vicinity of the surfaces of the ink droplets (gas-liquid interfaces and solid-liquid interfaces) in the ink for ink-jet recording containing the acrylic polymer. Application, ¶ [0013]. Therefore, when the ink droplets are adhered to portions disposed around the nozzle of the recording head, and the water is evaporated, then the concentration of the acrylic polymer is extremely increased in the vicinity of the surfaces of the ink droplets to form sticky or cohesive residues having high viscosities which behave as the obstacle to inhibit the straight travel stability of the ink droplets during the discharge of the ink from the nozzle. *Id.*

When the tripropylene glycol normal butyl ether and/or the dipropylene glycol normal propyl ether is contained in the ink for ink-jet recording containing the acrylic polymer, the tripropylene glycol normal butyl ether and/or the dipropylene glycol normal propyl ether exists in the vicinity of the surfaces of the ink droplets in place of the acrylic polymer, because the ethers have a stronger surface-activating function as compared with the acrylic polymer. *Id.* As a result, the localization of the acrylic polymer is avoided on the ink droplet surfaces, and most of acrylic polymer tends to be adsorbed to the coloring agent. *Id.* In order to cause such adsorption of the acrylic polymer to the coloring agent, a particular amount of the tripropylene glycol normal butyl ether and/or dipropylene glycol normal propyl ether with respect to the acrylic polymer is needed.

At one end, it has been found that a minimum of 0.5 of the tripropylene glycol normal butyl ether and/or dipropylene glycol normal propyl ether with respect to the acrylic polymer is needed. See Application, ¶ [0014] and Examples. At the other end, if the blending ratio exceeds a maximum of 2, the phenomenon of tripropylene glycol normal butyl ether and/or dipropylene glycol normal propyl ether localization in the vicinity of the gas-liquid interfaces has been saturated and the tripropylene glycol normal butyl ether or dipropylene glycol normal propyl ether also affects the adsorption of acrylic polymer to the coloring agent. Accordingly, the acrylic polymer, that was once adsorbed to the coloring agent and is now free, might replace some of the tripropylene glycol normal butyl ether or dipropylene glycol normal propyl ether that exists in the vicinity of the surfaces of the ink droplets. Therefore, it is desired that the blending ratio is not more than 2. See Application ¶ [0014] and Examples. Thus, the blending ratio 0.5 to 2 of tripropylene glycol normal butyl ether or dipropylene glycol normal propyl ether with respect to the acrylic polymer is important for the effect of the tripropylene glycol normal butyl ether or dipropylene glycol normal propyl ether.

With respect to Claim 7, Examiner contends that Kato discloses the ratio of dipropylene glycol mono-n-propyl ether to acrylic resin is 0.04 to 20. Office Action (8/7/07), P. 8. Examiner, in effect, argues that while not all inks with the disclosed amounts of glycol ether and acrylic polymer in Kato fall within the claimed ratio range of 0.5-2 of the current application, some combinations do fall within that range. However, Kato never discloses any specific examples falling within the claimed range. In addition, the disclosed ratio of Kato is 0.04 to infinity, as Kato discloses no upper limit of this ratio.

Kato states that "the weight ratio of the first colorant to the pigment contained in the second colorant in the ink composition is in the range of 1:3 to 7:1...." Kato, Col. 4, Lns. 42-47. Kato also states that the total amount of the first colorant and the pigment contained in the second colorant is not more than 20% by weight based on the ink composition. See, Kato, Col.4, Lns. 48-52. Kato also states that the content of the pigment in the first colorant is in the range of 0.1 to 10% by weight. Kato, Col. 3, Lns. 52-58. Thus the range of the total amount of the first colorant and the pigment contained in the second colorant is 0.112 (0.1 + (0.1 x 1/8)) to 20% by weight based on the ink composition. As a result, Kato discloses that the amount of pigment is 0.014% (0.112/[7+1] x 1) to 15% (20/[1+3] x 3) by weight based on the ink composition. Kato then goes on to state that the amount of the acrylic resin is in the range of 5 to 150% by weight based on the pigment. See, Kato, Col. 7, Lns. 42-46. As a result, Kato discloses that the amount of acrylic resin is 0.0007 (0.014 x 0.05) to 22.5% (15 x 1.5) by weight based on the ink composition. Kato also explicitly states that "[t]he amount of the glycol ether added is in the range of 1 to 20% by weight...." Kato, Col. 8, Lns. 6-7. Therefore, Kato also discloses that the ratio of the glycol ether with respect to the acrylic polymer is at least 0.044 (1/22.5) to 28,571 (20/0.0007) on the basis of weight. As a result, range claimed in the current invention of 0.5 to 2 is much narrower than the range disclosed in Kato.

The Examiner still erroneously maintains that maintains that Kato discloses that the amount of acrylic resin to be from 0.75 to 22.5%, and that the ratio of the glycol ether with respect to the acrylic polymer is 0.04 to 20. This is because, after stating that the maximum pigment is 15%, the Examiner uses that maximum amount of pigment to calculate both the minimum amount of acrylic polymer and the maximum amount of acrylic polymer. Applicants assert that the minimum amount of pigment must be used to calculate the minimum amount of acrylic polymer. Based on Applicants revised calculations above, the minimum amount of pigment is 0.014%. It is this number which must be used to calculate the minimum amount of acrylic polymer, not the maximum amount of 15%.

The entire support for Kato's disclosure of a range of acrylic resin is that "it is calculated that the acrylic resin is present in amount of 0.75-22.5%." Office Action (8/7/07), P. 8. As discussed above, Applicants have been able to arrive at Examiner's upper limit of 22.5%, but not Examiner's lower limit. As stated above, Applicants assert that Examiner has miscalculated that that the lower limit of the acrylic resin in Kato is 0.75%. Applicants believe

that the Examiner's erroneous statement of the lower limit of the acrylic resin in Kato stems from the Examiner's improper use of the maximum amount of pigment to calculate the minimum amount of acrylic polymer.

Accordingly, based on Applicants calculations as explained above, Applicants assert that the ratio of the glycol ether with respect to the acrylic polymer in the ink, as disclosed by Kato, must be taken to be 0.04 to 28,571.

The MPEP provides instruction for situations like this:

> When the prior art discloses a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. ... If the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of **unexpected results** within the claimed narrow range ... it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims. The unexpected results may also render the claims unobvious. The question of "sufficient specificity" is similar to that of "clearly envisaging" a species from a generic teaching. See MPEP § 2131.02. A 35 U.S.C. 102/103 combination rejection is permitted if it is unclear if the reference teaches the range with "sufficient specificity." **The examiner must, in this case, provide reasons for anticipation as well as a motivational statement regarding obviousness.**

MPEP § 2131.03[II] (emphasis added).

1. <u>Unexpected Results</u>

The unexpected result in this case is that, when an acrylic polymer is used in an ink, the requirements for straight travel stability of ink droplets during the discharge, recovery performance upon introduction into the recording head, fixation performance of printed matters, and drying performance after printing can be met by adjusting the blending ratio of dipropylene glycol normal propyl ether with respect to the acrylic polymer to be from 0.5 to 2 on the basis of weight.

The inventors of the present application discovered, among numerous combinations, that the combination of dipropylene glycol normal propyl ether and the acrylic polymer, in the specified proportional range of Claim 7, is excellent in straight travel stability, recovery performance, fixation performance, and drying performance as indicated in Table 12 of the present application.

Before Applicants' discoveries, adding an acrylic polymer to improve the recovery performance upon introduction into the recording head and improve the fixation performance, resulted in unstable discharge from the recording head and deteriorated straight travel stability of ink droplets. Application (as published), P. 1, ¶¶ [0007]-[0008]. It was unexpected that adding dipropylene glycol normal propyl ether, such that the blending ratio of dipropylene glycol normal propyl ether with respect to the acrylic polymer is 0.5 to 2 on the basis of weight, would stabilize discharge from the recording head and improve straight travel stability while maintaining the improved fixation performance. Because of this unexpected result, Applicants respectfully assert that the narrow claimed ratio range of 0.5 to 2 is not disclosed by Kato with "sufficient specificity" to constitute an anticipation of the claims.

2. No Reason for Anticipation or Motivation for Obviousness

Kato provides neither reason for anticipation nor any motivation regarding obviousness. First, Kato never discloses any effect on straight travel stability or recording head discharge stability by adding dipropylene glycol normal propyl ether to an ink containing an acrylic polymer. The glycol ethers of Kato are disclosed as being penetrating agents. Kato, Col. 7, Lns. 47-52. As such there is no reason for anticipation of the unexpected results of the current application that modifying the proportion of dipropylene glycol normal propyl ether to the acrylic polymer, such that their blending ratio is 0.5 to 2 on the basis of weight, improves the straight travel stability while maintaining the improved recovery performance and fixation performance obtained by the addition of the acrylic polymer.

Second, Kato teaches improving color development and fixation by the addition of a first and second colorant to the ink. Kato, Col. 3, Lns. 61-65. Never does Kato discuss any interaction between dipropylene glycol normal propyl ether and an acrylic polymer. In fact, the acrylic polymer in Kato is disclosed as a dispersant for the second colorant, rather than for use to improve recovery performance and fixation performance. Kato, Col. 3., Lns. 66-67; Col. 5, Lns. 1-7 and 45-50.

As a result, Kato provides no motivation to solve the problems addressed in the current application by modifying the proportion of dipropylene glycol normal propyl ether to the acrylic polymer. As such, Kato does not render the narrowly claimed ratio range of 0.5 to 2 obvious.

Examiner asserts that Kato renders Claim 7 obvious because the claimed range of 0.5 to 2 of Claim 7 lies inside the range of 0.04 to 28,571 disclosed in Kato. Office Action (8/7/07), P. 8-9. While this may be true in some cases, it is not so in the present case. As stated above, the narrower claimed range of 0.5 to 2 of Claim 7 has unexpected results. These unexpected results negate the fact that the claimed range lies within the range disclosed in Kato, and renders Claim 7 unobvious. See MPEP § 2131.03. It would not have been obvious to one of ordinary skill in the art to modify the disclosed range of 0.04 to 28,571 to come up with the claimed range of 0.5 to 2 because, as stated above, the results were unexpected.

Furthermore, Examiner asserts that there is no evidence in the Application to support the asserted unexpected results. However, Table 12 provides just such evidence. Examples 4 and 5 contain dipropylene glycol normal propyl ether in the specified ratio. As discussed above, the specification clearly sets forth what happens outside of that ratio. This demonstrates the importance of the ratio being within the range of 0.5 to 2.

Examiner asserts that the comparative data set forth in Table 12 in the present specification establishes the criticality of using dipropylene glycol normal propyl ether and acrylic polymer, not the criticality regarding the ratio of the amount of dipropylene glycol normal propyl ether to the amount of acrylic polymer. Applicant respectfully disagrees. All that is required is that the evidence show unexpected results when using the ratio recited in Claim 7 as compared to a ratio disclosed in the reference Kato which falls outside the ratio of Claim 7.

As discussed above, Kato discloses a ratio of dipropylene glycol normal propyl ether to acrylic polymer of 0.04 to 28,571. While Examiner may dispute this, Applicants have more than adequately proven this mathematically. Examiner admits that Table 12 discloses information related to compositions that fall within the claimed ratio. All that is disputed is whether Table 12 discloses information related to a ratio outside that of Claim 7, but inside that of Kato.

As stated abpve, the comparative examples of the present application can be summarized as follows:

Comparative Example 1	Tripropylene glycol normal butyl ether was singly used.
Comparative Example 2	Polyacrylic acid sodium salt was singly used.
Comparative Example 3	**Tripropylene glycol methyl ether and Polyacrylic acid sodium salt were used.**

Comparative Example 4	**Diethylene glycol diethyl ether and Polyacrylic acid sodium salt were used.**
Comparative Example 5	**Triethylene glycol dimethyl ether and Polyacrylic acid sodium salt were used.**
Comparative Example 6	**Triethylene glycol dimethyl ether and salt of copolymer of acrylic acid/sulfonic acid monomer were used.**

As can be seen in Comparative Examples 3-6, the comparative examples of the present application do compare the current invention to inks including other glycol ethers. These inks were found to be inadequate.

Kato states that "[s]poecific examples of preferred penetrating agents inlcude glycol ethers." Kato, Col. 7, Lns. 50-51 Accordingly, the current application does compare the ink of Kato to the present invention, and found the ink of Kato to be lacking. This not only further illustrates the unexpected results, but it also shows that no one of ordinary skill in the art would find it obvious to combine tripropylene glycol normal butyl ether with the acrylic polymer, such that their blending ratio is 0.5 to 2 on the basis of weight, as claimed in Claim 1. Therefore, Applicants have sufficiently displayed that the narrow range of Claim 7 has unexpected results when compared to the broad range of Kato.

In addition, the Examiner asserts that the range of Claim 7 lies inside of the range of Kato, and that, therefore, a *prima facie* case of obviousness exists. Office Action (3/23/07), P. 9 (referring to MPEP 2144.05). Applicant's respectfully assert that such a *prima facie* case does not exist in this case.

For a prima facie case to exist, MPEP 2144.05 requires that the prior art disclose a range. If the prior art disclosed no ratio range, but only disclosed the presence of dipropylene glycol normal propyl ether and acrylic polymer, then there is no doubt that a prima facie case would not exist. For example, if a claim covered an ink with 1-2% by weight of pigment, and the prior art only disclosed the presence of a pigment with no specified amount, then no *prima facie* case would exist, even though the prior art *implicitly* discloses a range of 0-100%. No *prima facie* case would exist because the prior art did not disclose a specific range. In the present case, Claim 7 recites that the ratio of dipropylene glycol normal propyl ether to acrylic polymer is 0.5 to 2. Kato discloses no specific ratio of dipropylene glycol normal propyl ether to acrylic ether. Rather, Kato *implicitly* discloses a ratio of dipropylene glycol normal propyl ether to acrylic polymer of 0.04 to 28,571. In fact, this disclosure is so indirect that the Examiner incorrectly

calculated that the disclosed range in Kato is 0.04 to 20. The disclosure of Kato is so similar to the *implicit* disclosure of 0-100% discussed above that its disclosure is inadequate to provide a *prima facie* case of obviousness of Claim 7.

Claim 7 also states, in part:

> "wherein a content of the acrylic polymer is **0.1 to 5 %** by weight with respect to a total amount of the ink." (emphasis added).

As stated above, the amount of acrylic resin in Kato can be calculated as 0.0007 (0.014 x 0.05) to 22.5% (15 x 1.5) by weight based on the ink composition. This calculated range of acrylic resin in Kato (0.0007 to 22.5% by weight) is much broader than the claimed content of the acrylic polymer as recited in amended Claim 7, namely "0.1 to 5 % by weight with respect to a total amount of the ink".

Thus, Applicants respectfully assert that a prima facie case does not exist based on Kato since Kato does not specifically teach or suggest the feature of "a content of the acrylic polymer is 0.1 to 5 % by weight with respect to a total amount of the ink", as recited in Claim 7.

Because Applicants have established a case of unexpected results of the claimed ratio of dipropylene glycol normal propyl ether to acrylic polymer, and because Examiner has failed to establish a *prima facie* case of obviousness due to the inadequacies of Kato's disclosure, Applicants respectfully assert that Claim 7 is not rendered obvious by Kato. Therefore, Applicants respectfully request that Examiner remove the rejection of Claim 7 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,440,203 to Kato.

B. CLAIM 8

Claim 8 is dependant upon Claim 7. As Claim 7 is allowable, so must be Claim 8. Therefore, Applicants respectfully request that Examiner remove the rejection of Claim 8 under 35 U.S.C. § 103(a) as being anticipated by U.S. Patent No. 6,440,203 to Kato.

C. CLAIM 10

Claim 10 states that "a content of the dipropylene glycol normal propyl ether is 0.5 to 5% by weight with respect to a total amount of the ink."

With respect to this claim, Examiner contends that, since Kato discloses the glycol ether can be in the range of 1-20% it anticipates the claimed range. 7/13/05 Office Action, P. 4, ¶ 6. However, Kato never discloses any specific examples falling within the claimed range.

In addition, the range disclosed in Kato both overlaps and is larger than the narrowly claimed range in the current application.

As with Claim 7 above, the MPEP provides instruction for situations like this. MPEP § 2131.03[II].

1. Unexpected Results

The unexpected result in this case is that, when an acrylic polymer is used in an ink, the requirements for straight travel stability of ink droplets during the discharge, recovery performance upon introduction into the recording head, fixation performance of printed matters, and drying performance after printing can be met by the addition of dipropylene glycol normal propyl ether in the range of 0.5 to 5% by weight with respect to a total amount of the ink.

The inventors of the present application discovered, among numerous combinations, that the combination of the acrylic polymer and dipropylene glycol normal propyl ether, in the specified range of Claim 10, is excellent in straight travel stability, recovery performance, fixation performance, and drying performance as indicated in Table 12 of the present application.

Before Applicants' discoveries, adding an acrylic polymer to improve the recovery performance upon introduction into the recording head and improve the fixation performance, resulted in unstable discharge from the recording head and deteriorated straight travel stability of ink droplets. Application (as published), P. 1, ¶¶ [0007]-[0008]. It was unexpected that adding dipropylene glycol normal propyl ether, such that the content of dipropylene glycol normal propyl ether is 0.5 to 5% by weight with respect to the total amount of the ink, would stabilize discharge from the recording head and improve straight travel stability while maintaining the improved fixation performance. Because of this unexpected result, Applicants respectfully assert that the narrow claimed ratio range of 0.5 to 5% is not disclosed by Kato with "sufficient specificity" to constitute an anticipation of the claims.

2. No Reason for Anticipation or Motivation for Obviousness

Kato provides neither reason for anticipation nor any motivation regarding obviousness. First, Kato never discloses any effect on straight travel stability or recording head discharge stability by adding dipropylene glycol normal propyl ether to an ink containing an acrylic polymer. The glycol ethers of Kato are disclosed as being penetrating agents. Kato, Col.

7, Lns. 47-52. As such there is no reason for anticipation of the unexpected results of the current application that the addition of dipropylene glycol normal propyl ether to an ink containing an acrylic polymer, such that the content of dipropylene glycol normal propyl ether is 0.5 to 5% by weight with respect to a total amount of the ink, improves the straight travel stability while maintaining the improved recovery performance and fixation performance obtained by the addition of the acrylic polymer.

Second, Kato teaches improving color development and fixation by the addition of a first and second colorant to the ink. Kato, Col. 3, Lns. 61-65. Never does Kato discuss any interaction between dipropylene glycol normal propyl ether and an acrylic polymer. In fact, the acrylic polymer in Kato is disclosed as a dispersant for the second colorant, rather than for use to improve recovery performance and fixation performance. Kato, Col. 3., Lns. 66-67; Col. 5, Lns. 1-7 and 45-50.

As a result, Kato provides no motivation to solve the problems addressed in the current application by modifying the proportion of dipropylene glycol normal propyl ether to the acrylic polymer. As such, Kato does not render the narrowly claimed ratio range of 0.5 to 5% obvious.

In addition, Claim 10 is dependant upon Claim 7. As Claim 7 is allowable, so must be Claim 10.

Examiner asserts that Kato renders Claim 10 obvious because the claimed range of 0.5 to 5% of Claim 10 overlaps the range of 1 to 20% disclosed in Kato. 8/29/06 Office Action, P. 4. While this may be true in some cases, it is not so in the present case. As stated above, the narrower claimed range of 0.5 to 5% of Claim 10 has unexpected results. These unexpected results negate the fact that the claimed range overlaps the range disclosed in Kato, and renders Claim 10 unobvious. See MPEP § 2131.03. It would not have been obvious to one of ordinary skill in the art to modify the disclosed range of 4 to 10% to come up with the claimed range of 0.5 to 5% because, as stated above, the results were unexpected.

Furthermore, Examiner asserts that there is no evidence in the Application to support the asserted unexpected results. However, Table 12 provides just such evidence. Examples 4 and 5 contain dipropylene glycol normal propyl ether in the specified amount. This demonstrates the importance of the amount being within the range of 0.5 to 5%.

As such, Applicants respectfully assert that Claim 10 is not rendered obvious by Kato. Therefore, Applicants respectfully request that Examiner remove the rejection of Claim 10 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,440,203 to Kato.

D. CLAIM 11

Claim 11 is dependant upon Claim 7. As Claim 7 is allowable, so must be Claim 11. Therefore, Applicants respectfully request that Examiner remove the rejection of Claim 11 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,440,203 to Kato.

E. CLAIM 12

Claim 12 is dependant upon Claim 7. As Claim 7 is allowable, so must be Claim 12. Therefore, Applicants respectfully request that Examiner remove the rejection of Claim 12 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,440,203 to Kato.

Based upon the above remarks, Applicant respectfully requests reconsideration of this application and its early allowance. Should the Examiner feel that a telephone conference with Applicant's attorney would expedite the prosecution of this application, the Examiner is urged to contact him at the number indicated below.

Respectfully submitted,

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